WEIGHTLIFTING APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to weightlifting apparatus that can be used for health and fitness, and more particularly relates to a weightlifting apparatus having a weight selection system that permits easy and convenient addition (or subtraction) of weights to a dumbbell-type weight device.

An important feature of weightlifting equipment is the ability to add or remove weights easily, without considerable loss of time and without experiencing the frustration of trying to deal with small connectors when tired and sweaty. Further, people in the middle of exercising want to control the amount of time between exercises, and do not want to spend considerable down time trying to adjust weight levels. At the same time, the weights must be securely held, so that they do not fall and create a safety hazard. Also, aesthetics and simplicity are important.

Accordingly, an apparatus is desired having the aforementioned advantages and solving the aforementioned problems.

SUMMARY OF THE PRESENT INVENTION

In one aspect of the present invention, a weightlifting apparatus includes a support frame having side sections defining a first direction and a handle adapted for grasping and lifting in a second direction different than the first direction. A plurality of weights are positioned between the side sections and have edges adjacent the side sections. An interlock mechanism includes slide members slidably engaging and movable along the side sections. The slide members are configured to selectively engage and disengage the edges of the weights so that, when the handle is lifted, selected ones of the weights are secured to the support frame and lifted with the support frame.

In another aspect of the present invention, a weightlifting apparatus includes a support frame having side sections defining a first direction and a handle adapted for grasping and lifting in a second direction different than the first direction. A plurality of weights are positioned between the side sections and have edges adjacent the side sections, each weight including an

interlock tab member that is slidable toward the side sections and slidable away from the side sections. An interlock mechanism is configured to selectively engage and disengage the interlock tab members with the side sections so that, when the handle is lifted, selected ones of the weights are secured to the support frame and lifted with the support frame and selected other ones of the weights are released from the support frame.

In yet another aspect of the present invention, a weightlifting apparatus includes a weight plate including a mid-section defining a first direction, opposing edges and an interlock member slidably engaging the mid-section for movement parallel the first direction. The interlock member has a locking end and is movable between a centered position where the locking end is located in an associated edge of the weight plate and an extended position where the locking end protrudes from the associated edge.

These and other features, objects, and advantages of the present invention will become apparent to a person of ordinary skill upon reading the following description and claims together with reference to the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is an exploded perspective view of a weightlifting apparatus including a base and a support frame, with some weights on the base and some weights on the support frame;

Fig. 2 is a perspective view of the support frame shown in Fig. 1;

Figs. 3 and 4 are perspective views of top and bottom subassemblies of the support frame of Fig. 2;

Fig. 5 is a perspective view of a flexible band and associated slide members from Fig. 2;

Fig. 6 is a perspective view of a weight assembly shown in Fig. 1;

Fig. 7 is an exploded perspective view of an interlock tab shown in Fig. 6;

Fig. 8 is a perspective view of the base shown in Fig. 1;

Fig. 9 is a perspective view of Fig. 1, with the support frame being shown resting in the base;

Figs. 10 and 11 are side views of a weight in the disengaged and engaged positions, respectively; and

Fig. 12 is a fragmentary view of the circled area VII in Fig. 11.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A dumbbell-type weightlifting apparatus 20 (Fig. 1) includes a rectangular ring-shaped support frame 21 adapted to rest on a base 22, with weight plate assemblies 23 (hereafter called "weights") positioned within the support frame 21 and with side edges 24 and 25 of the weights 23 adjacent side sections 26 and 27 of the support frame 21. (See also Fig. 9.) An interlock mechanism 28 includes slide members 29 and 30 on the side sections 26 and 27, respectively. The slide members 29 and 30 are interconnected by a flexible band 31 that extends around the support frame 21, such that the slide members 29 and 30 always move simultaneously but in opposite directions along the side sections 26 and 27. The weights 23 include interlock tabs 32 (Fig. 7) that are adapted to slide across guiding grooves 33 in center sections of the weights 23. The slide members 29 and 30 include ends with angled camming surfaces 29A and 30A that are configured to cammingly engage one end of the interlock tabs 32 to shift the interlock tabs 32 laterally from a naturally-centered disengaged position on the weights 23 (i.e. where ends of the interlock tabs 32 are located within the edges 24 and 25) (see top weights 23 in Fig. 1 and see Fig. 10), and to move the tabs 32 laterally along the grooves 33 to a laterally-protruding engaged position (i.e. where one of the ends of the tabs 32 is engaged with the side section 26 or the side section 27) (see bottom weights 23 in Fig. 1 and see Fig. 11).

More specifically, as the slide member 29 operably engages and cams one end of a particular tab 32, the slide member 29 moves laterally along direction A (Fig. 11) to a position where it engages and secures the weight 23 to the support frame 21 on one side edge, and simultaneously, the other end of the particular tab 32 moves into engagement with a corresponding area on the side section on the other end of the support frame 21. Also, as one slide member 29 is moved, the flexible band 31 simultaneously moves the other slide member 30, such that a second weight 23 on an opposite end of frame 21 is also engaged to the support frame 21 (see Fig. 1), the second weight 23 being in a balanced position to the first weight 23 relative to a handle bar 34 on the support frame 21. The result is that a simple linear stepped movement of the slide members 29 and 30 causes a balanced pair of the weights 23 to be engaged (or disengaged).

More specifically, the base 22 includes a body 40 (Fig. 8) with a series of upwardly-open U-shaped vertical grooves 41. The grooves 41 are optimally formed to vertically receive edges of the weights 23, and to hold non-selected weights 23 in a vertical position until additional weights

23 are desired. The body 40 includes a top rim 42 that is basically flat and configured to abut the support frame 21 when the support frame 21 (and selected weights 23 attached to it) are set onto and within the base 22. The recess 40´ in a center of the body 40 is closed on its bottom by a flat plate, but it can have angled sides to better mate with a bottom of the hex-shaped weights 23, if desired.

The weight plate assemblies 23 (Fig. 7) each includes a weight plate 45. The weight plate 45 can be any shape desired. The illustrated weight plate 45 is hexagonally shaped, which facilitates guiding a combination of the support frame 21 and selected weights 23 into the base 22. The weight plate 45 includes a notch 46 in each side edge 24 (and 25), and guiding grooves 33 on front and rear sides of the weight plate 45 that interconnect the notches 46.

The interlock tabs 32 (Fig. 7) includes two J-shaped members 48, and two springs 49. Each J-shaped member 48 includes a long section 50 shaped to slide along one of the grooves 33, and an enlarged head 51 positioned within one of the notches 46. The enlarged head 51 includes an angled surface 52 for matingly engaging the angled camming surface 29A or 30A (Fig. 5). The long section 50 (Fig. 7)is long and strong enough and the heads 51 large and strong enough such that when the interlock tabs 32 are laterally shifted by engagement with the slide members 29 (or 30), it has enough strength to engage the side sections 26 or 27 to retain the weight 23 to the support frame 21. Lubricant can be added in the grooves 33 or the long section 50 can be made of a lubricious material to allow free movement of the interlock tabs 32.

A biasing element, such as centering springs 49, is positioned in each of the notches 46 under each enlarged head 51, such that an individual J-shaped member 48 is biased outwardly toward one of the side sections 26 or 27. However, the two oppositely positioned J-shaped members 48 are secured together, such that they move as a unit. Thus, the two springs 49 provide forces that counteract against and offset each other, resulting in the interlock tabs 32 naturally moving to a centered position. It is noted that the biasing element could be any of a variety of different things, such as a bent leaf spring, a coil spring, an elastomer, or a resilient rubber member.

The support frame 21 (Fig. 2) includes a top subassembly (Fig. 3) and a bottom assembly (Fig. 4) attached together as follows. The illustrated top subassembly (Fig. 3) includes an injection molded or stamped rectangularly-shaped top ring 55 having an L-shaped cross section along its sides. Two fixed top half plates 56 are attached between the sides, such as by welding,

adhesive, or the like. The bottom subassembly (Fig. 4) similarly includes a rectangularly-shaped bottom ring 57 having an inversely-formed L-shaped cross section along its sides. Two fixed bottom half plates 58 are attached between the sides. The bottom half plates 58 (and top half plates 56) mate against the handle bar 34 and combine with the top fixed half plates 56 to form a combined plate that is similar to the shape of an individual weight plate 45, with notches 59 being formed on each side large enough to receive the slide members 29 and 30. A distance between the right and left plates 56/58 is about equal to or a little greater than a length of the slide member 29, and of the slide member 30. Strips 59A extend between the notches 59, and connect the half plates 56 and 58 and also stabilize the slide members 29 and 30 against the side sections 26 and 27. Thus, when the slide members 29 and 30 are centered, they are contained between the right and left plates 56/58, such that none of the weights 23 are engaged and retained to the support frame 21. Pins 61 at each corner connect the rings 55 and 57 together, and the band 31 extends around the pins 61. Top and bottom flanges 55A and 57A help protect the band 31. Band 31 can be rubber, cord, cable, cloth, or a steel strip. As the slide members 29 and 30 are moved along the side sections 26 and 27 away from the centered position, additional weights 23 are selectively secured to the support frame 21 and thus, when the support frame 21 is lifted, move with the support frame 21. Fig. 1 shows five weights 23 attached at each end to the support frame 21, and four of the weights 23 left in each end of the base 22. It is contemplated that any number of weights 23 can be used, and further that different materials can be used to make any of the above components.

When the top and bottom rings 55 and 57 are assembled together, they form an inwardly-facing rectangularly-shaped racetrack or groove 60 (Fig. 10) around an inner side of the support frame 21. The slide members 29 and 30 slide along this groove 60, and are held in the groove 60 in part by the notches in the fixed weight plates 56/58. Pins 61 are extended vertically through corners of the top and bottom rings 55 and 57 and are spaced into the groove 60 at the corners, and the band 31 extends along the groove 60 around the pins 61 at each corner. By this arrangement, the band 31 is slidable around the rectangular groove 60, carrying the slide members 29 and 30 along the side sections 26 and 27 in opposite directions as the band 31 is moved.

The slide members 29 and 30 are shaped to be fully located within and between the fixed weight plates 56/58 when in a centered position on the side sections 26 and 27 (Fig. 2), and

shaped to slide along the side sections 26 (or 27) to sequentially engage weights 23 as the slide members 29 and 30 are extended from between the fixed weight plates 56/58. The one slide member 29 includes a protrusion 64 that can be easily grasped to move the slide member 29, and which, due to the band 31, moves both slide members 29 and 30 simultaneously.

In the foregoing description, it will be readily appreciated by persons skilled in the art that modifications may be made to the invention without departing from the concepts disclosed herein. Such modifications are to be considered as included in the following claims, unless these claims by their language expressly state otherwise.